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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/954,515	09/17/2001	Hyung-Chul Choi	M0023/7000D	9063

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EXAMINER

HON, SOW FUN

ART UNIT	PAPER NUMBER
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1772

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/954,515

Applicant(s)

CHOI ET AL.

Examiner

Sow-Fun Hon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-24 and 26-32 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 18-24 and 26-32 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/13/05 has been entered.

Response to Amendment

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections have been withdrawn due to Applicant's amendment dated 06/13/05.

New Rejections

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

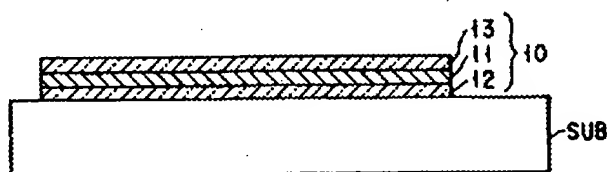
4. Claims 29-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The upper limit of less than about 30 nm is not specifically recited in the specification.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 18-24, 26-27, 29-30, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al. (US 5,667,853) in view of CERAC (CERAC Technical Publications).

Regarding claim 18, Fukuyoshi teaches an electrode assembly (multilayered conductive film), in Fig. 1 below, comprising a substrate (SUB); a first transparent oxide layer 12 formed on the substrate; a silver-based metallic layer 11 formed on transparent oxide layer 12; and a second transparent layer 13 formed on the conductive layer 11 (column 4, lines 20-30). The silver layer 11 is conductive (column 5, lines 55-60). Layers 12 and 13 are high refractive index layers (column 12, lines 1-10).



Fukuyoshi teaches that the resist film of the predetermined electrode pattern is formed on the transparent oxide layer 13, and that the electrode pattern is etched with the three thin layers aligned with each other, forming transparent multilayered

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conductive films of electrodes (not plural, column 13, lines 45-55). Hence at least the top transparent oxide layer 13 and the conductive layer 11 are patterned so as to divide the conductive layer into a plurality of discrete electrodes.

Fukuyoshi teaches a coating layer 21 of silica (silicon oxide, column 8, lines 40-41), disposed on at least one surface of the substrate SUB in Fig. 2 below.

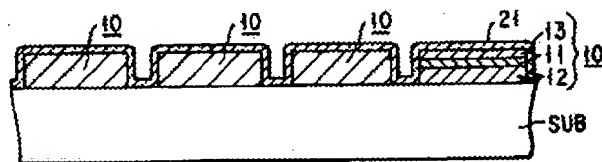


FIG. 2

Fukuyoshi teaches that the top transparent oxide layer 13 has a thickness of 30 to 100 nm (column 5, lines 25-30), which overlaps the claimed range of about 20 nm to about 100 nm. Fukuyoshi teaches that the high index top transparent oxide layer 13 comprises primarily indium oxide (column 6, lines 60-65) and a small amount of tin oxide (forming indium tin oxide), titanium (di)oxide or gallium oxide to adjust the conductivity (column 7, lines 20-30), but fails to disclose that it has a conductivity ranging from about 100 ohms/square to about 400 ohms/square.

CERAC teaches that high conductivity is balanced against high transmission in the visible light region, and that indium tin oxide must have a conductivity (in Applicant's terminology) or sheet resistance of greater than 100 ohms/square in order to obtain visible region transmission near 90 % (Film Properties section). An application is for electrodes (Introduction section).

Therefore, because CERAC teaches that high conductivity is balanced against high transmission in the visible light region, wherein the indium tin oxide must have a

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conductivity (sheet resistance) greater than 100 ohms/square in order to provide visible region transmission of near 90%, it would have been obvious for one of ordinary skill in the art at the time the invention was made, to have used indium tin oxide with a conductivity ranging from about 100 ohms/square to about 400 ohms/square as the high index transparent oxide top layer of Fukuyoshi, in order to obtain a conductive electrode with high transmission in the visible light region, as taught by CERAC.

Regarding claim 19, Fukuyoshi teaches a chip for driving the device formed overlying (on) a portion of the electrode (column 10, lines 25-35). Contacts, which are conductors, are needed to connect the electrodes to the chip. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a plurality of conductors connected to portions of the top layer overlying the discrete electrodes, in order to provide electrical contacts connecting the electrodes to the chip.

Regarding claim 20, Fukuyoshi teaches a set of electrodes 34 that is adjacent to the screen (user)-side substrate 31 in Fig. 3 (column 9, lines 14-24). The layer that is adjacent to the substrate with the potential of contacting the observer would need to be electrically insulating so as not to shock the user. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made the high index layer 12, which is adjacent to the screen-side substrate, an electrically insulating one, in order to protect the user from electrical shock.

Regarding claim 21, Fukuyoshi et al. teaches that the substrate is a synthetic resin (plastic) material (column 9, lines 40-50).

Regarding claims 22, 24, Fukuyoshi teaches that the high index top transparent oxide layer 13 comprises primarily indium oxide (column 6, lines 60-65) and a small amount of tin oxide (forming indium tin oxide), titanium (di)oxide or gallium oxide to adjust the conductivity (column 7, lines 20-30).

Regarding claim 23, Fukuyoshi teaches that the conductive layer 11 comprises silver and gold (column 5, lines 45-55) which form an alloy.

Claim 24 has been discussed above.

Regarding claim 26, Fukuyoshi teaches a liquid crystal display assembly comprising a liquid crystal material LC sandwiched (column 9, lines 49-50) between two electrode assemblies 42 and 34 in Fig. 3 (column 9, lines 35-40).

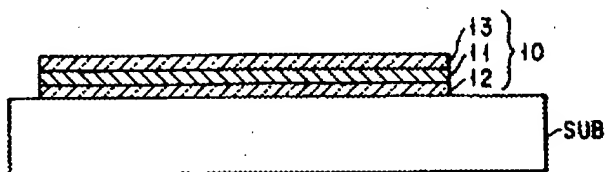
Regarding claim 27, although Fukuyoshi fails to teach that the liquid crystal display screen (column 21, lines 20-25) is a touch screen-type, touch screen displays are notoriously well known to one of ordinary skill in the art at the time the invention was made. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have made the liquid crystal display screen of Fukuyoshi into a touch-screen-type, in order to provide the desired touch-screen capability.

Regarding new claim 29, Fukuyoshi teaches an electrode assembly (multilayered conductive film), in Fig. 1 below, comprising a substrate (SUB); a first transparent oxide layer 12 formed on the substrate; a silver-based metallic layer 11 formed on transparent oxide layer 12; and a second transparent layer 13 formed on the conductive layer 11

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(column 4, lines 20-30). The silver layer 11 is conductive (column 5, lines 55-60).

Layers 12 and 13 are high refractive index layers (column 12, lines 1-10).



Fukuyoshi teaches that the resist film of the predetermined electrode pattern is formed on the transparent oxide layer 13, and that the electrode pattern is etched with the three thin layers aligned with each other, forming transparent multilayered conductive films of electrodes (not plural, column 13, lines 45-55). Hence at least the top transparent oxide layer 13 and the conductive layer 11 are patterned so as to divide the conductive layer into a plurality of discrete electrodes.

Although Fukuyoshi fails to teach that the top transparent oxide layer 13 has a thickness of from about 20 nm to less than about 30 nm, because Fukuyoshi teaches that the top transparent oxide layer 13 has a thickness of 30 to 100 nm (column 5, lines 25-30) wherein the lower limit is 30 nm, and does not teach against a lower thickness value, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided a thinner layer of top transparent oxide layer 13 in order to provide a thinner overall electrode for miniaturization purposes.

Fukuyoshi teaches that the high index top transparent oxide layer 13 comprises primarily indium oxide (column 6, lines 60-65) and a small amount of tin oxide (forming indium tin oxide), titanium (di)oxide or gallium oxide to adjust the conductivity (column 7,

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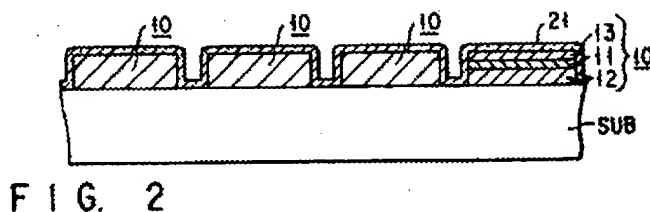
lines 20-30), but fails to disclose that it has a conductivity ranging from about 100 ohms/square to about 400 ohms/square.

CERAC teaches that high conductivity is balanced against high transmission in the visible light region, and that indium tin oxide must have a conductivity (in Applicant's terminology) or sheet resistance of greater than 100 ohms/square in order to obtain visible region transmission near 90 % (Film Properties section). An application is for electrodes (Introduction section).

Therefore, because CERAC teaches that high conductivity is balanced against high transmission in the visible light region, wherein the indium tin oxide must have a conductivity (sheet resistance) greater than 100 ohms/square in order to provide visible region transmission of near 90%, it would have been obvious for one of ordinary skill in the art at the time the invention was made, to have used indium tin oxide with a conductivity ranging from about 100 ohms/square to about 400 ohms/square as the high index transparent oxide top layer of Fukuyoshi, in order to obtain a conductive electrode with high transmission in the visible light region, as taught by CERAC.

Regarding claims 30, 32, Fukuyoshi teaches a coating layer 21 of silica (silicon oxide, column 8, lines 40-41), disposed on at least one surface of the substrate SUB in Fig. 2 below. Silica coating is hard. Fukuyoshi teaches that the layer of silica has a thickness of from 20 to 70 nm (column 8, lines 54-55), which overlaps the claimed range of from about 10 nm to about 30 nm.

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7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi in view of CERAC, as applied to claims 18-24, 26-27, 29-30, 32 above, and further in view of Yatabe et al. (US 4,234,654).

Fukuyoshi in view of CERAC teaches a substantially transparent electrode assembly comprising: a substrate; a high index layer formed on the substrate; a conductive layer formed on the high index layer; a high index top layer having a conductivity ranging from about 100 ohms/square to about 400 ohms/square, at least the top layer and the conductive layer being patterned so as to divide the conductive layer into a plurality of discrete electrodes.

Although Fukuyoshi in view of CERAC fails to teach that the top transparent oxide layer 13 has a thickness of from about 20 nm to less than about 30 nm, because Fukuyoshi teaches that the top transparent oxide layer 13 has a thickness of 30 to 100 nm (column 5, lines 25-30) wherein the lower limit is 30 nm, and does not teach against a lower thickness value, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a thinner layer of top transparent oxide layer 13, in order to provide the substantially transparent electrode assembly of Fukuyoshi in view of CERAC, with thinner overall dimensions for miniaturization purposes.

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In addition, Fukuyoshi teaches that the substrate is a synthetic resin (plastic) material (column 9, lines 40-50), but fails to specify the species.

Yatabe teaches a conductive laminate used as a transparent electrode structure for a liquid crystal display (column 9, lines 20-30). The substrate material may be polycarbonate, or polyacrylate (acrylic resin) (column 7, lines 55-65). Hence the claimed substrate materials are notoriously well known as substrates for electrode assemblies. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used polycarbonate or polyacrylate as materials for the synthetic resin substrate in the electrode assembly of Fukuyoshi, as demonstrated by Yatabe, in order to take advantage of the physical properties of said synthetic resins.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi in view of CERAC, as applied to claims 18-24, 26-27, 29-30, 32 above, and further in view of Tanitsu et al. (US 5,520,952).

Fukuyoshi in view of CERAC teaches a substantially transparent electrode assembly comprising: a substrate; a high index layer formed on the substrate; a conductive layer formed on the high index layer; a high index top layer having a conductivity ranging from about 100 ohms/square to about 400 ohms/square, at least the top layer and the conductive layer being patterned so as to divide the conductive layer into a plurality of discrete electrodes.

Although Fukuyoshi in view of CERAC fails to teach that the top transparent oxide layer 13 has a thickness of from about 20 nm to less than about 30 nm, because

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Fukuyoshi teaches that the top transparent oxide layer 13 has a thickness of 30 to 100 nm (column 5, lines 25-30) wherein the lower limit is 30 nm, and does not teach against a lower thickness value, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used a thinner layer of top transparent oxide layer 13, in order to provide the substantially transparent electrode assembly of Fukuyoshi in view of CERAC, with thinner overall dimensions for miniaturization purposes.

In addition, Fukuyoshi teaches a coating layer 21 of silica (silicon oxide, column 8, lines 40-41), which is hard, and is disposed on at least one surface of the substrate SUB in Fig. 2 below.

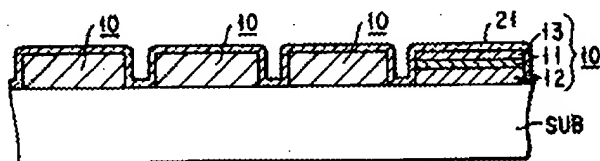


FIG. 2

Fukuyoshi in view of CERAC fails to teach that the coating layer of silica hard coating has a thickness of from about 1 micron to about 15 microns.

Tanitsu teaches that that the surface of electronic parts is required to be protected against mechanical damage by forming a hard coating thereon (protective coating film having high hardness, column 1, lines 14-18). Tanitsu teaches that the coating amount and hence thickness is dependent on the particular types of the substrate material, but that the thickness of the coating is usually in the range of from 0.01 to 5 microns (column 6, lines 20-25), which overlaps the claimed range of from about 1 micron to about 15 microns.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the hard coating of Fukuyoshi with a thickness of about 1 micron to about 15 microns, in order to provide the particular type of substrate of Fukuyoshi with the desired protection from mechanical damage, as taught by Tanitsu.

Response to Arguments

9. Applicant's arguments against the valid combination of Fukuyoshi in view of CERAC have been fully considered but they are not persuasive.

10. Applicant argues that there is no suggestion or motivation within Fukuyoshi et al. or the CERAC publication to vary the condition used to deposit the high index top layer and the high index layer in the way suggested by the Office action to deposit the high index top layer and the high index layer in the way suggested by the Office action to make the present claimed invention.

Applicant is respectfully apprised that Fukuyoshi teaches that the high index top transparent oxide layer 13 comprises primarily indium oxide (column 6, lines 60-65) and a small amount of tin oxide (forming indium tin oxide), titanium (di)oxide or gallium oxide to adjust the conductivity (column 7, lines 20-30), and that CERAC teaches that high conductivity is balanced against high transmission in the visible light region, and that indium tin oxide must have a conductivity (in Applicant's terminology) or sheet resistance of greater than 100 ohms/square in order to obtain visible region transmission near 90 % (Film Properties section), used in electrodes (Introduction

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section). Therefore both Fukuyoshi and CERAC teach the variation of the conductivity of the indium tin oxide to balance the conductivity with the light transmission.

In response to Applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

11. Applicant argues that Fukuyoshi, CERAC and Yatabe do not teach a layer of silica for promoting adhesion between the high index layer and the substrate, and that Fukuyoshi only discloses using a coating as a moisture seal for the uppermost electrode layer such that the coating is only in intermittent contact with the substrate surface.

Applicant is respectfully reminded that the feature Applicant is relying on: namely a silica coating which contacts the entire surface of the substrate and the entire surface of the high index layer, is not recited in the present claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

12. Applicant argues that the cited references do not teach or suggest the importance of adhesion promotion in general or the specific goal of adhering the high index layer to the substrate.

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Again, Applicant is respectfully reminded that the feature Applicant is relying on: namely a silica coating which contacts the entire surface of the substrate and the entire surface of the high index layer, is not recited in the present claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, Applicant is respectfully apprised that a chemical composition and its properties are inseparable. Therefore, if the prior art teaches the chemical structure, the properties applicant discloses and/or claims are necessarily present. In *re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). See MPEP 2112.01. The silica coating of Fukuyoshi is expected to promote adhesion between the substrate and the high index layer.

13. Applicant argues that Yatabe teaches a high index layer that is electrically insulating, not showing substantial conductivity.

Applicant is respectfully apprised that Yatabe is the secondary reference which teaches the synthetic resin materials of the substrate, while Fukuyoshi in view of CERAC is relied on to teach that the conductivity of the top high index layer is adjusted.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon
Sow-Fun Hon
08/08/05

[Signature]
HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

8/8/05